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their school work, and the schools would be benefited by having more teachers of the type of this author.

**Ruler and Compasses.** By HILDA P. HUDSON. London: Longmans, Green & Co. Pp. 143.

Miss Hudson in this little volume starts with Euclid's three postulates and shows that the use of the ruler corresponds with the linear equations and the use of the compasses with the quadratic equation. The answer then to the question as to what constructions are possible with ruler only and what constructions with the ruler and compasses, which answer geometry failed to give, is furnished by analysis. In other words, those problems and those alone can be solved by ruler only, which can be made to depend on a linear equation; and those problems and those alone can be solved by ruler and compasses, which can be made to depend on an algebraic equation, whose degree is a power of 2 and whose roots can be found by rational operations and the extraction of square roots only. The book contains very much of interest and profit for teachers of geometry.

**Differential and Integral Calculus.** By CLYDE E. LOVE. New York: The Macmillan Company. Pp. 339. \$2.10.

This appears a very good book on the subject, for the student using it should get a clear understanding of the various principles as he proceeds. The treatment of some topics would seem perhaps too abbreviated but brevity must be characteristic when the whole course, including three chapters on differential equations, is contained within the compass of 339 pages. The book is carefully written and appears to be well adapted for class use.

**Quartic Surfaces.** By C. M. JESSAP. Cambridge: The University Press, G. P. Putnam's Sons, American representatives. Pp. 198. \$3.00.

The aim of the author in this volume is to give a brief account of the principal known properties of quartic surfaces possessing nodes or nodal curves. On account of Hudson's work on "Kummer's Quartic Surface" a treatment of that surface with its special forms is omitted here. Ruled quartic surfaces are also omitted.

The Introduction gives a brief summary of all the leading results discussed later in the volume. The chapter headings are as follows: I. Quartic Surfaces with Isolated Singular Points; II. Desmic Surfaces; III. Quartic Surfaces with a Double Conic; IV. Quartic Surfaces with a Nodal Conic and Additional Nodes; V. The Cyclide; VI. Surfaces with a Double Line, Plücker's Surface; VII. Quartic Surfaces with an Infinite Number of Conics; Steiner's Surface; The Quartic Monoid; VIII. The General Theory of Rational Quartic Surfaces; IX. Determinant Surfaces.

**The Integration of Functions of a Single Variable.** By G. H. HARDY. Cambridge: The University Press. G. P. Putnam's Sons, American representatives. Pp. 67. 75 cents.

This is a new edition of number 2 of the "Cambridge Tracts in Mathematics and Mathematical Physics," which came out some years ago and differs from the former edition chiefly in replacing a faulty proof of Abel's by another.

**A Treatise on the Circle and Sphere.** By JULIAN LOWELL COOLIDGE. Oxford: The Clarendon Press. Pp. 603. \$6.75.

Every student of geometry will agree that the circle and sphere are perhaps the simplest of the geometrical figures, yet comparatively few realize how much there is centered about them. They force themselves on our attention in all parts of geometrical science, and have been treated by many prominent mathematicians like Steiner, Chasles, Möbius and others since the time the ancient Greeks did so much to complete the treatment of the circle. These figures in projective geometry, in function theory and in differential geometry have been treated by many authors, but Professor Coolidge has aimed in this volume "to present a consistent and systematic treatment of these various theories."

The magnitude of this undertaking will be better appreciated from the chapter headings, which are as follows: I. The Circle in Elementary Plane Geometry; II. The Circle in Cartesian Plane Geometry; III. Famous Problems in Construction; IV. The Tetracyclic Plane; V. The Sphere in Elementary Geometry; VI. The Sphere in Cartesian Geometry; VII. Pentaspherical Space; VIII. Circle Transformations; IX. Sphere Transformations; X. The Oriented Circle; XI. The Oriented Sphere; XII. Circles Orthogonal to one Sphere; XIII. Circles in Space, Algebraic Systems; XIV. The Oriented Circle in Space; XV. Differential Geometry of Circle Systems.

Even in a work of this magnitude some theorems must be omitted and the author gives preference to those which are most general in scope and to those which are unaltered by inversion. It is a piece of work which all students of higher geometry will want to read.

**Second Year Mathematics.** By ERNST R. BRESLICH. Chicago: The University of Chicago Press. Pp. 248+xviii. Price \$1.00 net.

Mr. Breslich's "First Year Mathematics" was reviewed in the issue of March, 1916, and what was said of that book helps to explain the second volume. In this volume geometry in two and three dimensions becomes the principal subject, algebra and trigonometry being taken up where they are needed or fit in. The book has many excellent features and seems to be a fitting continuation of the earlier one. It is planned to be usable after first year algebra as well as following its own first volume.